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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/002,096	10/18/2001	Bin Zhao	12569-06/NEC	1986

7590

07/31/2003

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EXAMINER

FINEMAN, LEE A

ART UNIT

PAPER NUMBER

2872

DATE MAILED: 07/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicant(s)

10/002,096

Applicant(s)

ZHAO, BIN

Examiner

Lee Fineman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 June 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 22-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Species II in Paper No. 4 is acknowledged.
2. Claims 22-27 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim.

Claim Objections

3. Claims 12-14 objected to because of the following informalities: On line 3, "Gire-Tournois" should be --Gires-Tournois--. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-5, 9-12 and 15-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Ducellier, U.S. Patent No. 6,570,711 B2.

Regarding claims 1, 4-5, 15 and 17, Ducellier discloses an interleaver (fig. 3) comprising a beam separator/recombiner (58), which is a polarization beam splitter, configured to separate

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two beam component beam (56, only one of which is see in the figure) into first (59) and second (60) approximately equal amplitude subcomponents thereof, each component beam having a defined polarization direction (column 4, lines 51-52), the beam separator/recombiner also being configured to subsequently recombine the separated first and second subcomponents back into components (71, column 5, lines 1-2); a first reflector (63) configured to direct the first subcomponent from the beam separator/recombiner back into the beam separator/recombiner (column 4, lines 54-56); and a second reflector (64) configured to direct the second subcomponent from the beam separator/recombiner back into the beam separator/recombiner (column 4, lines 61-67). The method of utilizing the structure of the claim is inherent therein.

Regarding claims 2-3 and 16, Ducellier further discloses an input beam separator (53), which is a polarization beam separator, configured to separate an input beam into two component beams in a manner which defines a polarization direction of each component beam (column 4, lines 42-45). The method of utilizing the structure of the claim is inherent therein.

Regarding claim 9, Ducellier further discloses a half-wave waveplate (57) configured to orient each component beam such that the beam separator/combiner separates each component beam into two subcomponent beams having approximately equal amplitude (column 4, lines 47-51); and a quarter-wave waveplate (62, 64) configured to orient each subcomponent beam such that the subcomponent beams recombine in the beam separator/recombiner and such that the subcomponent beams do not interfere substantially with the component beam(s) prior to the component beam(s) being separated by the separator/recombiner.

Regarding claim 10, Ducellier further discloses an intermediate beam separator (73, 74) configured to separate each component beam from the beam separator/recombiner into two

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subcomponent beams (76, 77), the intermediate beam separator comprising a half-wave waveplate (73) and a polarization beam displacer (74).

Regarding claim 11, Ducellier further discloses an output beam recombiner (74, 96) configured to combine subcomponent beams into component beams (85), the output beam recombiner comprising a half-wave waveplate (96) and a polarization beam displacer (74).

6. Claims 1-8, 11 and 15-19 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen et al., U.S. Patent No. 6,169,626 B1.

Regarding claims 1, 4-5 and 15-17, Chen et al. disclose an interleaver (fig. 9) comprising a beam separator/recombiner (950 and 970), wherein the beam separator/recombiner comprises at least one polarization beam splitter (950), configured to separate two beam component beam (unnumbered going into 950) into first and second approximately equal amplitude subcomponents thereof, each component beam having a defined polarization direction (column 7, lines 28-37), the beam separator/recombiner also being configured to subsequently recombine the separated first and second subcomponents back into components (in so far as horizontal and vertical subcomponents are combined back into even and odd channels); a first reflector (974) configured to direct the first subcomponent from the beam separator/recombiner back into the beam separator/recombiner (fig. 9); and a second reflector (972) configured to direct the second subcomponent from the beam separator/recombiner back into the beam separator/recombiner (fig. 9). The method of utilizing the structure of the claim is inherent therein.

Regarding claims 2-3 and 16, Chen et al. further discloses an input beam separator (932), which is a polarization beam separator, configured to separate an input beam into two component

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beams in a manner which defines a polarization direction of each component beam (column 7, lines 23-27). The method of utilizing the structure of the claim is inherent therein.

Regarding claims 6-8 and 18-19, Chen et al. further disclose in fig. 5 wherein the first reflector (530) comprises a Gires-Tournois reflective resonator having a front surface reflectivity of approximately zero and having a rear surface reflectivity of approximately 100% (column 5, lines 29-35); the second reflector comprises a Gires-Tournois reflective resonator (540) having a front surface reflectivity of greater than zero and having a rear surface reflectivity of approximately 100% (column 5, lines 39-47); and the first reflector provides a phase delay of approximately one half of the phase delay provided by the second reflector (the gap of the first reflector is one half of the second reflector, column 5, lines 33 and 44). The method of utilizing the structure of the claim is inherent therein.

Regarding claim 11, Chen et al. further discloses an output beam recombiner (930 or 934) configured to combine subcomponent beams into component beams, the output beam recombiner comprising a half-wave waveplate (unnumbered, fig. 9) and a polarization beam displacer (930 or 934).

7. Claims 1, 4-7, 15 and 17-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Cao, U.S. Patent No. 6,130,971.

Regarding claims 1, 4-5, 15 and 17-18, Cao discloses an interleaver (fig. 4) comprising a beam separator/recombiner (470), which is a polarization beam splitter, configured to separate two beam component beam (510 and 520 (fig. 5), 610 and 620 (fig. 6)) into first and second approximately equal amplitude subcomponents thereof, each component beam having a defined

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polarization direction (figs. 5 and 6), the beam separator/recombiner also being configured to subsequently recombine the separated first and second subcomponents back into components (column 4, lines 2-54); a first reflector (490A) configured to direct the first subcomponent from the beam separator/recombiner back into the beam separator/recombiner (fig. 4); and a second reflector (490B) configured to direct the second subcomponent from the beam separator/recombiner back into the beam separator/recombiner (fig. 4). The method of utilizing the structure of the claim is inherent therein.

Regarding claims 6-7 and 18, Cao further discloses wherein the first and second reflectors comprise Gires-Tournois reflective resonators (see fig. 8). The method of utilizing the structure of the claim is inherent therein.

8. Claim 20 is rejected under 35 U.S.C. 102(e) as being anticipated by Zhou et al., U.S. Patent No. 6,559,992 B1 (henceforth Zhou '992).

Zhou '992 discloses a device for mitigating dispersion (fig. 6) comprising a Gires-Tournois resonator (column 1, lines 56-28); and a polarization selection element (628) configured to direct light to the Gires-Tournois resonator and configured to reflect light from the Gires-Tournois resonator away from light input to the polarization selection element.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. in view of Zhou '992

Chen et al. discloses the claimed invention except for further comprising at least one dispersion mitigating stage comprising a dispersion mitigating Gires-Tournois resonator; and a polarization beam splitter configured to transmit light to a dispersion mitigating Gires-Tournois resonator and configured to reflect light from the dispersion mitigating Gires-Tournois resonator away from light input to the polarization beam splitter such that the light reflected away from light input to the polarization beam splitter does not interfere with the light input to the polarization beam splitter. Zhou '992 teaches a device (fig. 6) for mitigating dispersion with a dispersion mitigating Gires-Tournois resonator (column 1, lines 56-28); and a polarization beam splitter (628) configured to transmit light to a dispersion mitigating Gires-Tournois resonator and configured to reflect light from the dispersion mitigating Gires-Tournois resonator away from light input to the polarization beam splitter such that the light reflected away from light input to the polarization beam splitter does not interfere with the light input to the polarization beam splitter (fig. 6). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the dispersion mitigating device of Zhou '992 to the system of Chen et al. to provide better chromatic dispersion compensation.

11. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou '992 in view of Zhou et al., U.S. Patent No. 6,243,200 B1 (henceforth Zhou '200).

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Zhou '992 discloses the claimed invention except wherein the polarization selection element comprises a quarter-wave waveplate configured to cause the polarization beam splitter to reflect light away from the light input to the polarization beam splitter. Zhou '200 teaches in fig. 7 a system wherein the resonator system includes a quarter-wave waveplate (71) configured to cause the polarization beam splitter (33) to reflect light away from the light input to the polarization beam splitter and a zero-order beam displacer (72). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add a quarter-wave waveplate and make the beam displacer a zero order beam displacer in the resonator system of Zhou '992 to provide better alignment control (column 7, lines 42-55).

12. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. in view of Zhou '992 as applied to claim 12 above and further in view Zhou '200.

Chen et al. in view of Zhou '992 as applied to claim 12 above further discloses a half-wave waveplate (624, Zhou '992) configured to orient light when the light passes through the dispersion mitigating stage of the Gires-Tournois resonator such that the light does not interfere with light input to the polarization beam splitter. Chen et al. in view of Zhou '992 as applied to claim 12 above discloses the claimed invention except for configured to orient light when the light passes through the dispersion mitigating stage of the Gires-Tournois resonator such that the light does not interfere with light input to the polarization beam splitter. Zhou '200 teaches in fig. 7 a system wherein the resonator system includes a quarter-wave waveplate (71) configured to cause the polarization beam splitter (33) to reflect light away from the light input to the polarization beam splitter and a zero-order beam displacer (72). It would have been obvious to

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one of ordinary skill in the art at the time the invention was made to add a quarter-wave waveplate and make the beam displacer a zero order beam displacer in the dispersion mitigating resonator system of Chen et al in view Zhou '992 to provide better alignment control (column 7, lines 42-55).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lee Fineman whose telephone number is (703) 305-5414. The examiner can normally be reached on Monday - Friday 7:30 - 4:00.

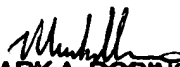
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (703) 305-0024. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.



LAF

July 13, 2003


MARK A. ROBINSON
PRIMARY EXAMINER